

Notice of Allowability

Application No.

10/750,040

Applicant(s)

GROVER ET AL.

Examiner

Art Unit

Zhuo H. Li

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 4/21/2006.
2. ☒ The allowed claim(s) is/are 1,4-8,11-15 and 18-21.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

- | | |
|---|--|
| 1. <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 5. <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 2. <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 6. <input type="checkbox"/> Interview Summary (PTO-413),
Paper No./Mail Date _____. |
| 3. <input type="checkbox"/> Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date _____ | 7. <input checked="" type="checkbox"/> Examiner's Amendment/Comment |
| 4. <input type="checkbox"/> Examiner's Comment Regarding Requirement for Deposit
of Biological Material | 8. <input checked="" type="checkbox"/> Examiner's Statement of Reasons for Allowance |
| | 9. <input type="checkbox"/> Other _____. |



EXAMINER'S AMENDMENT AND STATEMENT OF REASONS FOR ALLOWANCE

EXAMINER'S AMENDMENT

1. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Paul A. Mendonsa (Reg. No. 42,879) on May 8, 2006.

The application has been amended as follows:

Claim 15. A system comprising:

a processor;

a non-volatile cache coupled to the processors, wherein the non-volatile cache is a cache for a hard disk of the system; and

a machine having stored thereon a set of instructions which when executed cause the system to perform a method comprising of:

determining a status of a the system;

setting an associativity level of the non-volatile cache of the system, based on the status of the system, wherein in response to determining the system is receiving power from a battery power source, setting the associativity level to a first level of associativity, the first level of associativity includes greater associativity than a second level of associativity.

Claim 17. Canceled.

Claim 18. The system of claim ~~17~~ 15, wherein in response to determining the system is receiving AC power from a wall outlet, setting the associativity level to the second level of associativity.

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

2. Claims 1, 4-8, 11-15, and 18-21 are allowed.

3. The following is an examiner's statement of reasons for allowance:

Applicant's invention is drawn to a computer system and method for storing and reading data in different associativity levels of a non-volatile memory cache by determining the power source (i.e., a computer system of the hard disk is capable to adjust a non-volatile memory cache associativity based on the receiving power from a battery power source, and setting the associativity level to a first level of associativity, in order to prevent loss of the data, and reduce the frequency of the spinning up the hard disk when the AC power is failed).

Applicant's independent claims 8 and 15 each recites, *inter alia*, a non-volatile cache (212) of the hard disk (208) in the computer system (200) with a structure as defined in the specification (pages 6-8) is capable to setting an associativity level of the non-volatile cache to a first level of associativity in response to receiving power from a batter power source, wherein the

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first level of associativity includes greater associativity than a second level associativity.

Applicant's independent claims 8 and 15 each comprises a particular combination of element, which is neither taught nor suggest by the prior art.

Applicant's independent method claim 1, recites, inter alia, setting an associativity level of non-volatile memory unit of the system, based on the status of the system, wherein the non-volatile memory unit is a cache for a hard disk of the system and in response to determining the system is receiving power from a batter power source, setting the associativity level to a first level of associativity, the first level of associativity includes greater associativity than a second level of associativity. These steps, in combination of the remaining steps, are neither taught nor suggested by the prior art.

Accordingly, Applicant's claims are allowed for these reasons, and for the search result by the examiner, which was disclosed.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. The prior are made of record and not relied upon is related to applicant's disclosure. Acton et al. (US PAT. 6,957,355) discloses a method and system for managing cache levels based on battery backup level, which monitor the level of charge stored in the exhaustible power source, and further adjusting the storage level of the cache by adjusting the capacity of dirty data stored in the cache which must be flushing to the disk, in response to a detected change in the

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level of charge (abstract and (col. 5 line 45 through col. 7 line 5), which Acton neither teaches the cache memory is a non-volatile memory and is a set associative cache, which capable to adjust different associativity levels by detecting different power source, nor disclosed the non-volatile cache having first level of associativity includes greater associativity than a second level of associativity.


5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zhuo H. Li whose telephone number is 571-272-4183. The examiner can normally be reached on Tues - Fri 9:00am - 6:30pm and alternate Monday..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Kim can be reached on 571-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

6. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zhuo H. Li

Patent Examiner
May 17, 2006


MATTHEW KIM
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER

